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ABSTRACT

The Office of Research and Evaluation (ORE) of the Austin Independent School District (AISD) (Texas) reviews the effectiveness of many of the school district's special programs. In 1992-93, ORE reviewed 60 programs or program components. Cost effectiveness was calculated for 31 programs, using an achievement effect measure for 10, a dropout prevention effect measure for 13, and a drug prevention effect measure for 8. An additional three dropout prevention programs were rated on effectiveness, although cost information could not be obtained. Three drug prevention programs were rated for cost, but not effectiveness, and another 23 programs were evaluated on effectiveness based on other evaluation information. Two-thirds of the programs were rated as effective, and 60% were considered cost-effective where calculation was possible. Three of four elementary school technology schools were the most cost-effective among achievement improvement programs. A parent-training program, Mega Skills, was the most cost-effective dropout prevention program, while Plays for Living and Drug Abuse Resistance Education (DARE) were the most cost-effective drug abuse prevention programs. Seventeen tables present evaluation findings. (Contains 11 references.) (SLD)

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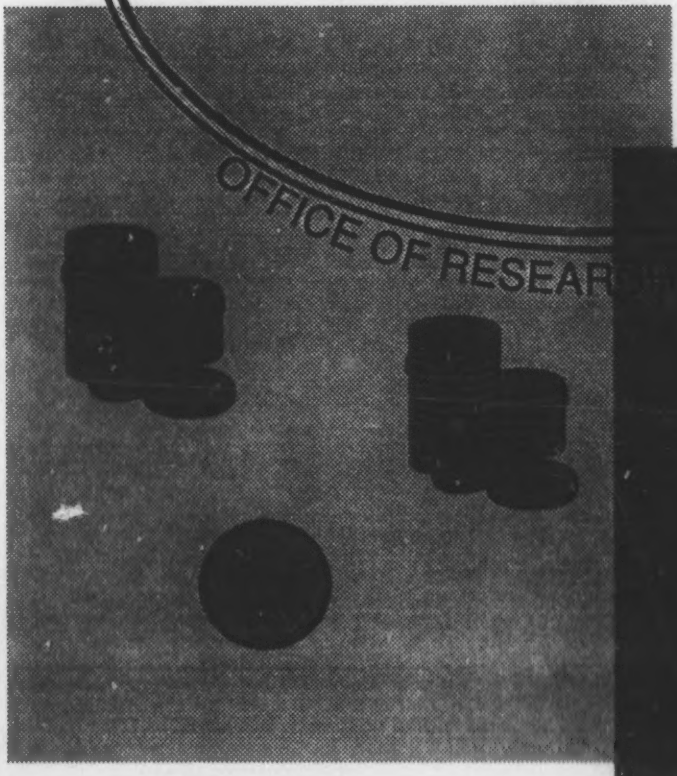
AUSTIN INDEPENDENT SCHOOL DISTRICT
OFFICE OF RESEARCH AND EVALUATION

Program Effectiveness in AISD 1992-93



ED 380 468

PROGRAM EFFECTIVENESS IN AISD, 1992-93
Executive Summary

Austin Independent School District
Office of Research and Evaluation

Authors: David Wilkinson, Evangelina Mangino

Program Description

For the past five years, ORE has provided the Board of Trustees with comparisons of the effectiveness of many of the District's special programs. Beginning in 1992-93, in response to the Board's request to provide it with a measure of effect as well as cost for the programs examined, ORE has prepared program effectiveness charts which include, where possible, cost-effectiveness for the programs and program components evaluated. Each February, at the Board's annual budget study session, ORE presents these program effectiveness charts for the programs evaluated the previous year. The document presented to the Board in February 1993 was a working draft. This report is the finished product.

Cost-effectiveness was calculated by dividing a measure of cost in dollars by one of three measures of effect: (1) achievement, (2) not dropping out, or (3) not using drugs. The cost of a program was defined as a program's appropriation (i.e., budget). The achievement measure of effect was based on standardized test scores from either the Norm-referenced Assessment Program for Texas (NAPT) or the Iowa Tests of Basic Skills (ITBS). The dropout prevention measure of effect was derived from the comparison in ORE's GENeric Evaluation SYStem (GENESYS) of the number of students in a program predicted to drop out with the actual number who did drop out. The drug prevention measure of effect was determined from the comparison of the rate of recent use of an illicit substance by program participants with the rate of recent use by students in the District overall. The cost-effectiveness ratio, expressed in dollars, which results from dividing cost by effect (C/E) is a measure of the cost-effectiveness of a program, i.e., the amount of effect for monies expended.

Where cost or effect measures were not obtainable, and other evaluation information about a program was available, ORE staff assigned ratings of effectiveness to the programs evaluated based on other indicators, such as survey results or the attainment of program objectives.

Major Findings

1. ORE reviewed 60 1992-93 programs or program components. Cost-effectiveness was calculated for 31 programs (52%), 10 using an achievement effect measure, 13 using a dropout prevention effect measure, and 8 programs using a drug prevention effect measure. An additional three dropout prevention programs were rated on effectiveness, although cost information could not be obtained. The costs of three drug prevention programs were obtained, but effectiveness information was lacking. Another 23 programs were rated on effectiveness based on other evaluation information. (Pages 6-18)

2. From the review of program, it was determined that:

   - Two thirds (65%) of the programs were rated as effective; 60% were cost-effective (of those where calculations were possible). (Pages 6-18)

   - Three of the four elementary technology schools were the most cost-effective among achievement improvement programs. (Pages ii, 7-8)

   - MegaSkills, a parent training program, was the most cost-effective dropout prevention program. (Pages ii, 10-11)

   - Plays for Living and DARE were the most cost-effective drug abuse prevention programs. (Pages ii, 13)

Budget Implications

Mandate: Requested by the Board of Trustees

Funding Amount: $10,000 (estimated) (for producing the program effectiveness report)

Funding Source: Local

Implications:

While still developmental, the methodology for assessing the cost-effectiveness of programs provides additional perspective not afforded by separate assessments of effectiveness and cost. Programs can be evaluated in terms of their relative costs in meeting the same outcome criteria: improving student achievement, preventing students from dropping out, or preventing students from using drugs. In other words, alternative programs can be evaluated on the basis of their costs for raising student test scores, or the cost for each potential dropout averted, or the cost for each student prevented from alcohol or other drug use. Other success indicators notwithstanding, information about which programs provide the maximum effectiveness per level of cost or require the least cost per level of effectiveness will assist in decisions about which programs to keep and expand, which to modify, and which to discontinue.

1992-93 Programs, Ranked Ordered According to Cost-Effectiveness, Most to Least

PROGRAM (Based on an Achievement Measure)	COST/EFFECT
Elementary Technology Demonstration Schools - Patton Funding Source: External Grades: Pre-K - 5	$ 65
Elementary Technology Demonstration Schools - Galindo Funding Source: External Grades: Pre-K - 5	$ 67
Elementary Technology Demonstration Schools - Andrews Funding Source: External Grades: Pre-K - 5	$ 119
Science Academy Funding Source: External Grades: 9-12	$ 130
Chapter 1 Schoolwide Projects (low achievers) Funding Source: External Grades: K-6	$ 177
Chapter 1 Supplementary Instruction (low achievers) Funding Source: External Grades: K-6	$ 411
Priority Schools (low achievers) Funding Source: External & Local Grades: K-6	$ 463
PROGRAM (Based on a Dropout Prevention Measure)	**COST/EFFECT**
MegaSkills (High Schools) Funding Source: External Grades: 9-12	$ 517
Mentor (Middle Schools) Funding Source: External Grades: 7-8	$ 689
Newcomers Program (Title VII) Funding Source: External Grades: 9-12	$ 984
PAL (Middle Schools) Funding Source: External Grades: 9-12	$ 1,643
Robbins Secondary School Funding Source: External Grades: 9-12	$ 3,978
Mentor (High School) Funding Source: External Grades: 9-12	$ 4,853
Austin Youth River Watch Funding Source: External Grades: 9-12	$ 61,050
ESOS (Martin and Mendez) Funding Source: External Grades: 7-8	$ 68,229
SHIRY (Kealing JHS) Funding Source: External Grade: 7	$ 106,200
ESOS (Johnston) Funding Source: External Grades 9-12	$ 250,743
PROGRAM (Based on a Drug Prevention Measure)	**COST/EFFECT**
Plays for Living Funding Source: External Grades: Pre-K - 6	$ 13
Drug Abuse Resistance Education (DARE) Funding Source: External Grades: 5, 7	$ 39
MegaSkills Funding Source: External Grades: Pre-K - 12	$ 200
Peer Assistance and Leadership (PAL) Funding Source: External Grades: Pre-K - 12	$ 942
Innovative Programs Funding Source: External Grades: K-12	$ 1,000
Student Alcohol and Drug Abuse Education and Prevention Program (SADAEPP) Funding Source: External Grades: 4-12	$ 1,259
Quality Schools Funding Source: External Grade: 5	$ 3,820

Austin Independent School District
Office of Research and Evaluation
1992-93 ROSE Summary Rank Order

HIGH SCHOOLS		JR. HIGH/MIDDLE SCHOOLS		ELEMENTARY SCHOOLS	
Austin	0.25	Kealing	0.19	Maplewood	0.48
L.B.J.	0.21			Bryker woods	0.35
				Brooke	0.32
				Mathews	0.32
				Zavala	0.29
				Barrington	0.27
				Gullett	0.25
				Highland Park	0.25
				Walnut Creek	0.21
				Casis	0.20
				Lee	0.18
				Ortega	0.17
Anderson	0.12	Burnet	0.08	Barton Hills	0.14
				Houston	0.14
				Linder	0.12
				Doss	0.09
				Galindo	0.08
				Zilker	0.08
				Allison	0.08
				Pease	0.07
				Travis Heights	0.06
				Norman	0.06
				Palm	0.05
				Andrews	0.05
				Blanton	0.05
Johnston	0.04	Fulmore	0.05	Oak Hill	0.04
Lanier	-0.01	Martin	0.04	Campbell	0.04
McCallum	-0.03	O.Henry	0.04	Patton	0.04
		Lamar	0.03	Odom	0.03
		Dobie	0.02	Wooldridge	0.03
		Murchison	0.00	Joslin	0.03
		Pearce	-0.01	Pillow	0.03
		Covington	-0.01	Blackshear	0.02
				Hill	0.02
				Davis	0.02
				Graham	0.01
				Menchaca	0.01
				Oak Springs	-0.03
				Cook	-0.04
				Sanchez	-0.04
				Pleasant Hill	-0.04
Bowie	-0.09	Bedichek	-0.07	Reilly	-0.05
Crockett	-0.12	Porter	-0.09	Cunningham	-0.05
Robbins	-0.14	Webb	-0.09	Dawson	-0.06
		Mendez		Harris	-0.06
				Kiker	-0.06
				Brentwood	-0.06
				Becker	-0.07
				Widen	-0.07
				Jordan	-0.08
				Pecan Springs	-0.08
				Allan	-0.10
				Brown	-0.11
				St. Elmo	-0.12
				Sunset Valley	-0.13
				Wooten	-0.13
Travis	-0.25			Kocurek	-0.15
Reagan	-0.27			Winn	-0.15
				Summitt	-0.17
				Metz	-0.18
				Langford	-0.19
				Govalle	-0.22
				Ridgetop	-0.23
				Williams	-0.31
				Boone	-0.32
				Sims	-0.41

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PROGRAM EFFECTIVENESS IN AISD, 1992-93

Background

For the past five years, ORE has provided the Board of Trustees with comparisons of the effectiveness of many of the District's special programs. In 1992-93, at the Board's request to provide it with a measure of effect as well as cost in the program effectiveness charts ORE prepares for the Board's annual budget study session, ORE conducted a retrospective examination of 1991-92 AISD programs. In February 1993, ORE presented the Board with program effectiveness charts which included cost-effectiveness ratios for many programs evaluated during 1991-92. Comments and suggestions from the Board of Trustees, District staff, and community members were used to fine tune the methodology and the format in which the information was reported. A final report titled *What Works, And Can We Afford It? Program Effectiveness in AISD, 1991-92* was issued in May 1993.

The methodology developed for assessing the cost-effectiveness of programs was applied to the programs evaluated by ORE in 1992-93, and each of ORE's final reports contained a program effectiveness summary including, where possible, cost-effectiveness information. In February 1994, ORE presented the Board with a draft document containing program effectiveness charts, and cost-effectiveness ratios, for programs evaluated during 1992-93. This report is the finished product.

Cautions

The methodology ORE has developed is still being refined. Although we have had numerous indications that we are on the "leading edge" of this type of analysis, we are mindful of several methodological difficulties which we have not fully resolved. Therefore, we do not represent our findings as the last word on how to determine what an effective program is. We hope, however, that they will provide a basis for continuing discussion about how best to evaluate the success of the District's programs.

Please keep three factors in mind when interpreting cost-effectiveness ratios.

1. Only achievement test scores, dropout rates, and self-reported drug and alcohol usage rates were used as measures of program effectiveness for calculating the cost-effectiveness ratios. Over the years, ORE has encouraged everyone to consider a wide range of information when assessing the impact of programs. For the purpose of calculating cost-effectiveness, however, what was needed were measures of effect common across all types of programs. Standardized achievement test scores, from the Norm-referenced Assessment Program for Texas (NAPT) and the Iowa Tests of Basic Skills (ITBS), were used because they our most reliable, broadest based, and most readily available measure of achievement. Other effectiveness measures need to be explored, however. For example, the elementary technology demonstration schools have shown better gains on the Texas Assessment of Basic Skills (TAAS) than on the NAPT. Readers are encouraged to read the detailed ORE evaluation reports to find information on other outcomes such as this.

2. The methodology used to calculate the cost-effectiveness ratios, while based in the general research literature, was applied according to our best professional judgment. Much additional discussion and study of the methodology will need to occur to establish our confidence that it appropriately reflects how much effect is attained for each dollar spent in special programs.

3. Better documentation and reporting of the costs of special programs and the numbers of students served is needed if cost-effectiveness analysis is to be a wholly useful tool for evaluation and decision making.

Method

Following Henry Levin's definition of cost effectiveness, cost effectiveness is obtained by dividing cost by effect.

$$\text{Cost Effectiveness} = \frac{\text{cost}}{\text{effect}}$$

The equation is very simple, but assigning values to the terms in the numerator and denominator is complex and can be controversial.

Cost

Program costs are reported as budgeted amounts. Actual expenditures may vary. Some programs with relatively low costs may require substantial indirect resources for staff support, facilities, etc. Volunteers hold the costs down in some programs, but expansion of those programs could cost more if the pool of available volunteers is not large enough to accommodate expansion.

Outcomes or Effect

Program outcomes in these charts are again simple in concept, though more complicated in application. If available, NAPT/ITBS scores were used. If the program focused on dropout prevention, then the dropout rate was used. If the program focused on drug abuse prevention, then student drug use rate was employed. This procedure seems straightforward, but NAPT/ITBS is only one of many measures of student academic progress. TAAS, college entrance exams (SAT and ACT), grade-point average (GPA), and many other alternatives could be used. NAPT/ITBS was chosen because it is our most reliable, broadest based, and most readily available measure. In order to compare cost-effectiveness across programs, a single effect measure is essential.

	EFFECT	
ACHIEVEMENT	NOT DROPPING OUT	NOT USING DRUGS
ITBS/NAPT GAIN vs Comparable Students or District Average or National Average	Difference between the number of students who were predicted to drop out and the actual number of dropouts	Difference between the number of program students using drugs and the number using drugs districtwide

Where NAPT/ITBS are used, outcomes are reported as the achievement gain in grade equivalent months--above and beyond what the students would have gained without the program. A grade equivalent month is the amount of gain made on the NAPT/ITBS by an average student during one month of instruction.

For programs for at-risk students, clearly the dropout rate is appropriate. However, these programs can certainly have benefits beyond just keeping students in school. These charts look simply at how much the program spent to keep <u>one</u> student from dropping out. In other words, if the student population served typically has 20 dropouts annually, and among the program students only 15 dropped out, then the program is credited with keeping five in school. This can make the cost per student kept in school high, because 20 at-risk students may have to be served to net one dropout kept in school.

For drug prevention programs, rates of student drug use are appropriate outcomes. However, these rates must rely on the anonymous responses of a sample of students surveyed about their own use of illicit substances. In addition, student identification of the programs serving them many not have been flawless.

Programs for which no NAPT/ITBS were available and which were not dropout or drug prevention programs were rated on the basis of other evaluation information collected.

Cost-effectiveness

Outcomes are divided into the cost of the program per student to give the cost to produce one month of achievement gain, or into the total program cost to calculate the cost to keep one potential dropout in school, or into the total program cost to calculate the cost to prevent one student from using drugs. A caution to the reader is that we may not be able to produce twice the effect for twice the cost. We do not know what relationships would exist if we spent more or less money on a program. However, this cost-effectiveness number does tell us what we did spend for the amount of effect realized.

Some programs do not have a cost-effectiveness amount shown, because they had no positive effect or because their impact was actually negative.

COST/EFFECT (C/E)
Cost/Achievement Gain
or
Cost for at-risk students/# of potential dropouts staying in school
or
Cost/# of students not using drugs

RATING	
Surveys:	**Other Indicators:**
- Staff	**- Retention Rate**
- Students	**- Attendance**
- Parents	**- Goal Attainment**
	- Discipline Rate

Effectiveness of 1992-93 Programs

Attached are several charts showing the cost-effectiveness of some of AISD's 1992-93 special programs.

A. Cost-effectiveness of 1992-93 Programs Based on an Achievement Measure

B. Cost-effectiveness of 1992-93 Programs Based on a Dropout Prevention Measure

C. Cost-effectiveness of 1992-93 Programs Based on a Drug Prevention Measure

Another chart shows program effectiveness where cost-effectiveness could not be calculated.

D. Effectiveness of 1992-93 Programs Based on Other Indicators

Effectiveness of Schools

In many ways, schools may be thought of as programs and are sometimes the more appropriate unit of analysis. The Report On School Effectiveness (ROSE) serves as the basis for comparing the effectiveness of schools. If the differences between predicted and actual achievement in each test area in each grade in a school, expressed in grade equivalents, are averaged, the result is the average residual (difference) for the school. This statistic is presented in the attached chart for all AISD schools for 1992-93. The schools are ordered from most positive difference to most negative difference.

Findings

1992-93 Programs

Most programs evaluated in 1992-93 in AISD are rated as effective. Approximately 21% of the ratings are based on achievement, 35% are based on the number of students not dropping out, and 44% are based on other evaluation findings.

Achievement Gains

In general, the programs showing the highest achievement gains for students served tend to be programs that offer students enriching experiences in addition to the regular curriculum. Most of these programs have a relatively high initial cost. But once the program is in place, the gain for the per-pupil cost is relatively low.

Successful **Academic Programs**	Effect (Gain)	Cost/Effect Index
Science Academy	12	130
Ch.1 Schoolwide Project (Low Achievers)	2	177
Ch.1 Supplementary (Low Achievers)	2	411
Technology at Patton	1	65
Technology at Galindo	1	67
Technology at Andrews	1	119
Priority Schools (Low Achievers)	1	463

Dropout Prevention

A common feature among successful dropout prevention programs is that they provide students with individual attention or the possibility of flexibility in class schedules and enrichment activities. Many of these programs are dependent on the use of volunteers or mentors. The cost reported for these programs does not reflect the in-kind contribution of volunteers.

Successful **Dropout Prevention Programs**	Effect (% Stayed)	Cost/Effect Index
MegaSkills (High School)	100	515
ESOS	100	68,400
SHIRY (Kealing)	100	106,667
Project MAN	100	Not Available
Title VII Newcomers Program	96	984
Robbins	96	4,161
Peer Assistance and Leadership (PAL)	50	1,637
Project Mentor (Middle/Jr. High School	40	684
Austin Youth River Watch Program	33	61,210
ESOS (Johnston)	33	250,800

Drug Prevention

Among successful drug prevention programs, underlying themes are the presentation of informative material and the interaction with other caring persons--parents, police officers, and older peers. Drug prevention programs which serve all of the students at a specific grade (e.g., DARE) cost less than programs that select students based on specific characteristics.

Successful **Drug Prevention Programs**	Effect (% Prevented)	Cost/Effect Index
MegaSkills	17	200
Drug Abuse Resistance Education (DARE) Program	10	39
Plays for Living	10	13
Innovative Programs	4	1,000
Peer Assistance Leadership (PAL)	4	942
Quality Schools	3	3,880
Student Alcohol and Drug Abuse Education and Prevention Program (SADAEPP)	3	1,259

COST-EFFECTIVENESS OF 1992-93 PROGRAMS BASED ON AN ACHIEVEMENT MEASURE

EXAMPLE

PROGRAM	ALLOCATION (COST)	NUMBER OF STUDENTS* SERVED	COST PER STUDENT	EFFECT (in months)	COST PER STUDENT FOR 1 MONTH GAIN (COST/EFFECT)	RATING
Elementary Technology Demonstration School (Andrews) Funding Source: External Grades: Pre-K - 5	$63,253 $1,580,956 Investment cost for hardware, software, and wiring.	843	$75	R: 0.5 M: 0.75 Avg.: 0.63	$119	0

Elementary Technology Demonstration School (Andrews), 1992-93 - Grades: Pre-K - 5

Cost: $63,253 (1992-93 operations), $1,580,956 (hardware, software, and wiring).

Number of Students Served: 843

Cost Per Student: $75 [$63,253/843 = $75.03 = $75 rounded]

Effect: R: 0.5 M: 0.75 Avg. = 0.63

[Because all grades were served, the ROSE residuals in reading for grades 2, 3, 4, and 5 were averaged: -0.1 + 0.2 + -0.1 + 0.2 /4 = 0.05. The mathematics ROSE residuals for grades 2, 3, 4, and 5 were averaged: -0.1 + 0.1 + 0.2 + 0.1 /4 = 0.075. Effects are transformed to months by multiplying by 10, so the reading and mathematics effects become 0.5 and 0.75, respectively. The reading and mathematics ROSE residuals were averaged: 0.5 + 0.75 = .0.63.]

Cost/Effect: $119 [$75/0.63 = $119.05 = $119 rounded]

What this means is that it costs $119 per year per Andrews student using the computers to attain six-tenth of one month's achievement gain above that the student would normally have achieved as the result of the regular instructional program.

Rating: 0 (A rating of zero was assigned because less than a one-month achievement gain was made.)

Cost-Effectiveness of 1992-93 Programs Based on an Achievement Measure

PROGRAM	COST	NUMBER OF STUDENTS SERVED	COST PER STUDENT SERVED	EFFECT (in months)	COST EFFECT	RATING
Chapter 1 Schoolwide Projects (all students) Funding Source: External Grades: K-6	$1,881,525	4,633	$406	Reading: -1.0 Math: N/A Avg.: N/A		-
Chapter 1 Schoolwide Projects (low achievers) Funding Source: External Grades: K-6	$616,308	1,518	$406	Reading: 2.3 Math: N/A Avg.: N/A	$177	+
Chapter 1 Supplementary Instruction (low achievers) Funding Source: External Grades: K-6	$1,452,917	1,682	$864	Reading: 2.1 Math: N/A Avg.: N/A	$411	+
Elementary Technology Demonstration Schools - Andrews Funding Source: External Grades: Pre-K - 5	$63,253 $1,580,956 Investment cost for hardware, software, and wiring.	843	$75	Reading: .5 Math: .75 Avg: .63	$119	0
Elementary Technology Demonstration Schools - Galindo Funding Source: External Grades: Pre-K - 5	$44,235 $246,000 Investment cost for hardware, software, and wiring.	751	$59	Reading: .5 Math: 1.25 Avg: .88	$67	0
Elementary Technology Demonstration Schools - Langford Funding Source: External Grades: Pre-K - 5	$53,744 $1,229,642 Investment cost for hardware, software, and wiring.	574	$94	Reading: -1.0 Math: -1.5 Avg: -1.25	-	0

Rating is expressed as contributing to any of the five AISD strategic objectives.

+	*Positive*, needs to be maintained or expanded
0	*Not significant*, needs to be improved and modified
-	*Negative*, needs major modification or replacement
Blank	*Unknown*

Cost is the expense over the regular District per student expenditure of about $4,000.

0	*No cost* or minimal cost
$	*Indirect costs* and overhead, but no separate budget
$$	*Some direct costs*, but under $500 per student
$$$	*Major direct costs* for teachers, staff, and/or equipment in the range of $500 per student

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PROGRAM	COST	NUMBER OF STUDENTS SERVED	COST PER STUDENT SERVED	EFFECT (in months)	COST EFFECT	RATING
Elementary Technology Demonstration Schools -Patton Funding Source: External Grades: Pre-K - 5	$63,253 $1,834,320 Investment cost for hardware, software, and wiring.	1,307	$48	Reading: .25 Math: 1.25 Avg: .75	$65	0
Priority Schools (all students) Funding Source: External & Local Grades: K-6	$2,149,744*	6,628	$324	Reading: -1.1 Math: N/A Avg.: N/A		-
Priority Schools (low achievers) Funding Source: External & Local Grades: K-6	$380,052*	1,173	$324	Reading: 0.7 Math: N/A Avg.: N/A	$463	+
Science Academy Funding Source: Local Grades: 9-12	$821,999	546	$1,505	Avg.: 11.5	$130	+

COST-EFFECTIVENESS OF 1992-93 PROGRAMS BASED ON A DROPOUT PREVENTION MEASURE

EXAMPLE

PROGRAM	ALLOCATION (COST)	NUMBER OF STUDENTS* SERVED	COST PER STUDENT	NUMBER OF DROPOUTS		PREDICTED DROPOUTS WHO STAYED IN SCHOOL (EFFECT)		COST PER STUDENT KEPT IN SCHOOL (COST/ EFFECT)	RATING
				Predicted	Obtained	#	%		
Newcomers Program Funding Source: External Grades: 9-12	$26,000	At risk: 134 Total: 134	$940	134	6	128	96	$984	+

Newcomers Program, 1992-93 - *Grades*: 9-12

Cost: $26,000

Number of Students Served: 134

Cost Per Student: $940 [$26,000/134 = $940.30 = $940 rounded]

Effect: 128

[Predicted 134 students, Obtained 6 students]

134 - 6 = 128 students prevented from dropping out

Cost/Effect: $984 [$26,000/128 = $984.38 = $984 rounded]

What this means is that it costs $984 for each student prevented from dropping out by the Newcomers Program who would otherwise have been expected to drop out of school.

Rating: +

Cost-Effectiveness of 1992-93 Programs Based on a Dropout Prevention Measure

PROGRAM	COST	NUMBER OF STUDENTS SERVED	COST PER STUDENT SERVED	NUMBER OF DROPOUTS Predicted	NUMBER OF DROPOUTS Obtained	PREDICTED DROPOUTS WHO STAYED IN SCHOOL (EFFECT) #	PREDICTED DROPOUTS WHO STAYED IN SCHOOL (EFFECT) %	COST PER STUDENT KEPT IN SCHOOL (COST/ EFFECT)	RATING
Austin Youth River Watch Funding Source: External Grades: 9-12	At risk: $61,050 Total: $82,500	At risk: 23 Total: 31	$2,661	3	2	1	33	$61,050	
Education for Parenthood Infant Development Centers (Johnston HS) Funding Source: External Grades:	At risk: $44,100 Total: $67,846	At risk: 24 Total: 37	$1,834	5	5	0	0		0
ESOS (Johnston HS) Funding Source: External Grades: 9-12	At risk: $250,743 Total: $302,100	At risk: 44 Total: 53	$5,700	3	2	1	33	$250,743	+
ESOS (Middle Schools/ Martin and Mendez) Funding Source: External Grades: 7-8	At risk: $ 68,229 Total: $119,700	At risk: 12 Total: 21	$5,700	1	0	1	100	$ 68,229	+
MegaSkills (Middle Schools) Funding Source: External Grades: 7-9	At risk: $1,786 Total: $3,369	At risk: 19 Total: 36	$94	2	4	0	0		0
MegaSkills (High Schools) Funding Source: External Grades: 9-12	At risk: $1,033 Total: $2,152	At risk: 11 Total: 23	$94	2	0	2	100	$ 517	+
Mentor (Middle School) Funding Source: External Grades: 7-8	At risk: $2,755 Total: $4,750	At risk: 144 Total: 250	$19	10	6	4	40	$ 689	+

Rating is expressed as contributing to any of the five AISD strategic objectives.

+	*Positive*, needs to be maintained or expanded
0	*Not significant*, needs to be improved and modified
-	*Negative*, needs major modification or replacement
Blank	*Unknown*

Cost is the expense over the regular District per student expenditure of about $4,000.

0	*No cost* or minimal cost
$	*Indirect costs* and overhead, but no separate budget
$$	*Some direct costs*, but under $500 per student
$$$	*Major direct costs* for teachers, staff, and/or equipment in the range of $500 per student

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PROGRAM	COST	NUMBER OF STUDENTS SERVED	COST PER STUDENT SERVED	NUMBER OF DROPOUTS Predicted	NUMBER OF DROPOUTS Obtained	PREDICTED DROPOUTS WHO STAYED IN SCHOOL (EFFECT) #	PREDICTED DROPOUTS WHO STAYED IN SCHOOL (EFFECT) %	COST PER STUDENT KEPT IN SCHOOL (COST/ EFFECT)	RATING
Mentor (High School) Funding Source: External Grades: 9-12	At risk:$14,559 Total: $33,858	At risk: 774 Total: 1,782	$19	202	199	3	1	$ 4,853	+
Newcomers Program (Title VII) (High Schools) Funding Source: External Grades: 9-12	At risk:$126,000 Total: $126,000	At risk: 134 Total: 134	$940	134	6	128	96	$984	+
PAL (Middle Schools) Funding Source: External Grades: 9-12	At risk: $3,286 Total: $9,664	At risk: 62 (estimate) Total: 183	$53	4	2	2	50	$ 1,643	
Project MAN (LBJ HS) Funding Source: External Grades: 9-12	No financial information available	At risk: 12 Total: 25		2	0	2	100		+
Robbins Secondary School Funding Source: External Grades: 9-12	At risk:$1,081,986 Total: $1,081,986	At risk: 272 Total: 272	$3,978	272	12	260	96	$4,161	+
SHIRY (Kealing JHS) Funding Source: External Grades: 7	At risk: $106,200 Total: $180,000	At risk: 16 Total: 27	$6,667	1	0	1	100	$106,200	+
SHIRY (Martin JHS) Funding Source: External Grades: 7	At risk:$ 84,600 Total: $180,000	At risk: 8 Total: 17	$10,588	1	1	0	0		0
Zenith (Austin HS) Funding Source: External Grades: 9-12	No financial information available	At risk: 27 Total: 32		7	3	4	57		
Zenith (Bowie HS) Funding Source: External Grades: 9-12	No financial information available	At risk: 20 Total: 34		3	4	-1	-33		

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COST-EFFECTIVENESS OF 1992-93 PROGRAMS BASED ON A DRUG PREVENTION MEASURE

EXAMPLE

DRUG-FREE SCHOOLS (DFS) PROGRAM	COST	NUMBER OF STUDENTS* SERVED	COST PER STUDENT*	NUMBER OF STUDENTS PREVENTED FROM ALCOHOL AND OTHER DRUG (AOD) USE (EFFECT)	COST PER STUDENT PREVENTED FROM AOD USE (COST/EFFECT)	RATING
Drug Abuse Resistance Education (DARE)	$43,298	11,190	$3.87	1,119	$39	+

* Participants

Cost: $43,298

Number of Students Served: 11,190

Cost Per Student: $3.87 ($43,298/11,190 = $3.87)

Number of Students Prevented from Alcohol and Other Drug (AOD) Use (Effect): 1,119 Students prevented from AOD use by the District Drug Free School (DFS) programs is calculated by subtracting the rate of use for the DFS program students (the recent use rate for DARE participants was 30%), from the average rate of use for all students in the District (40%). That difference (10%) was multiplied by the total number of students served by the program (11,190 * .10 = 1,119)

Number of Students Prevented from Alcohol and other Drug (AOD) Use (Effect): 1,119

Cost Per Student Prevented from AOD Use (Cost/Effect): $39 ($43,298/1,119 = $38.69 = $39 rounded)

Rating: +

Rating is expressed as contributing to any of the five AISD strategic objectives.

+	*Positive*, needs to be maintained or expanded
0	*Not significant*, needs to be improved and modified
-	*Negative*, needs major modification or replacement
Blank	*Unknown*

Cost is the expense over the regular District per student expenditure of about $4,000.

0	*No cost* or minimal cost
$	*Indirect costs* and overhead, but no separate budget
$$	*Some direct costs*, but under $500 per student
$$$	*Major direct costs* for teachers, staff, and/or equipment in the range of $500 per student

Cost-Effectiveness of 1992-93 Programs Based on a Drug Prevention Measure

DRUG-FREE SCHOOLS (DFS) PROGRAM	COST	NUMBER OF STUDENTS* SERVED	COST PER STUDENT*	NUMBER OF STUDENTS PREVENTED FROM ALCOHOL AND OTHER DRUG (AOD) USE (EFFECT)	COST PER STUDENT PREVENTED FROM AOD USE (COST/EFFECT)	RATING
All Well Health Services Funding Source: External Grades:	$ 3,000	10 staff	$300 staff	Insufficient information		
Conflict Resolution Project Funding Source: External Grades:	$33,352	39 students 57 staff	$368 per participant	0		-
Drug Abuse Resistance Education (DARE) Funding Source: External Grades:	$43,298	11,190	$3.87	1,119	$39	+
Innovative Programs Funding Source: External Grades:	$37,014	932	$39.71	37	$1,000	+
K-12 Curriculum Funding Source: External Grades:	$47,186	64,171	$ .74	Rating based on program records of service		+
Medicine Education and Safety Program Funding Source: External Grades:	$ 5,772			Rating based on completion of project and on reactions to conference presentations		+
MegaSkills Funding Source: External Grades:	$21,798 DFS --- $17,664 Ch.2; $20,705 Ch.1	1,643 parents 643 students	$13.27 per parent DFS $93.57 per student DFS --- $36.62 (Total for all programs)	109	$200	+
Peer Assistance and Leadership (PAL) Funding Source: External Grades:	$56,715	1,044	$52.81	42	$942	+
Plays for Living Funding Source: External Grades:	$ 6,000	4,472	$1.34	447	$13	+

DRUG-FREE SCHOOLS (DFS) PROGRAM	COST	NUMBER OF STUDENTS* SERVED	COST PER STUDENT*	NUMBER OF STUDENTS PREVENTED FROM ALCOHOL AND OTHER DRUG (AOD) USE (EFFECT)	COST PER STUDENT PREVENTED FROM AOD USE (COST/EFFECT)	RATING
Private Schools Funding Source: External Grades:	$18,143	2,779	$6.53	Evaluation did not take place for this component.		
Quality Schools Funding Source: External Grades:	$160,452	306 staff 602 students	$524.35 per staff trained $266.53 per student	42	$3,820	+
Student Alcohol and Drug Abuse Education and Prevention Program (SADAEPP) Funding Source: External Grades:	$94,433 DFS $20,579 Ch.2	2,488	$37.96	75	$1,259	+
Student Assistance Program (SAP) Funding Source: External Grades:	$24,851	185 staff	$134.33	Staff training was not evaluated this year.		

* Participants

Rating is expressed as contributing to any of the five AISD strategic objectives.

+	*Positive*, needs to be maintained or expanded
0	*Not significant*, needs to be improved and modified
-	*Negative*, needs major modification or replacement
Blank	*Unknown*

Cost is the expense over the regular District per student expenditure of about $4,000.

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EFFECTIVENESS OF 1992-93 PROGRAMS BASED ON OTHER INDICATORS

EXAMPLE

PROGRAM	COST	NUMBER OF STUDENTS* SERVED	COST PER STUDENT*	EVIDENCE	COST/EFFECT	RATING
Chapter 1 Migrant Supplementary Instruction Funding Source: External Grades: K-12 Level of Service: 1-2 hrs./week, all year	$101,015	124	$815	Program met its goals		+

* Participants

Cost: $101,015

Number of Students Served: 124

Cost Per Student: $815.00 ($101,015/124 = $815)

Rating: +

Effectiveness of 1992-93 Programs Based on Other Indicators

PROGRAM	COST	NUMBER OF STUDENTS SERVED	COST PER STUDENT SERVED	EVIDENCE	COST/ EFFECT	RATING
Chapter 1 Migrant Supplementary Instruction Funding Source: External Grades: K-12	$101,015	124	$815	Program met its goals		+
Chapter 1 Neglected of Delinquent Institutions Funding Source: External Grades: 1-12	$109,768	1,185	$93	Program met its goals		+
Chapter 1 Nonpublic Schools Funding Source: External Grades: 1-7	$26,608	48	$554	Program met its goals		+
Chapter 2 Academic Decathlon Funding Source: External Grades: 11-12	$41,747	70	$487	Rating based on staff surveys		+
Chapter 2 Library Resources Funding Source: External Grades: K-12	$43,950	69,440	$0.61	Rating based on staff surveys		+
Chapter 2 Megaskills Funding Source: External Grades: 6-8	$17,664 Ch.2 --- $20,705 Chapter 1 $21,798 Drug Free Schools	1,643 (parents)	$10.75 (per parent) --- $36.62 (Total for all programs)	Rating based on dropout rate, retention, grades, attendance, & discipline		0
Chapter 2 Middle School Fellows Program Funding Source: External Grades: 6-8	$25,708	44 (staff)	$135	Rating based on written comments offered by participants		+
Chapter 2 Multicultural/Special Funding Source: External Grades: Pre-K-12	$11,000	10,208	$1.00	Rating based on user survey		+

Rating is expressed as contributing to any of the five AISD strategic objectives.

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0	*Not significant*, needs to be improved and modified
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Blank	*Unknown*

Cost is the expense over the regular District per student expenditure of about $4,000.

0	*No cost* or minimal cost
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$$$	*Major direct costs* for teachers, staff, and/or equipment in the range of $500 per student

92.41

PROGRAM	COST	NUMBER OF STUDENTS SERVED	COST PER STUDENT SERVED	EVIDENCE	COST/ EFFECT	RATING
Chapter 2 Prekinder Supplements Funding Source: [illegible] Grades: Pre-K	$123,834	114	$209	Rating based on PPVT-R & TVIP gains from pre- to posttest		+
Chapter 2 Private Schools Funding Source: External Grades: Pre-K-1	$19,803	3,039	$6.17	Based on rating of purchases		+
Chapter 2 Reading Recovery Teacher Leader Training Funding Source: External Grades:	$57,062	1 (staff)	$57,062*	Rating based on interview with participants		+
Chapter 2 Secondary Library Technology Support Funding Source: External Grades: 6-12	$18,280	21,937	$0.80	Rating based on staff survey		+
Chapter 2 Spanish Academy Funding Source: External Grades:	$32,899	295 (staff)	$112	Based on course evaluation by participants		+
Chapter 2 Student Alcohol and Drug Abuse Education and Prevention Program Funding Source: External Grades: 5-12	$20,579 Ch.2 $94,433 Drug-Free Schools	2,488	$8.27 $46.23 (Total for all programs)	Rating based on staff and student survey		+
Chapter 2 Technology Learning Center at Johnston High Funding Source: External Grades: 9-12	$16,534	1,723	$9.60	No assessment conducted		
Chapter 2 Using Technology for Access to Problem Solving Funding Source: External Grades: 8	No funds received	4,921	0	Chapter 2 Discretionary project; No assessment conducted		
Chapter 2 Wicat Computer Lab at Blanton Elementary Funding Source: External Grades: (Pre-K-6)	$17,133	481	$35.62	Rating based on teacher survey		+

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PROGRAM	COST	NUMBER OF STUDENTS SERVED	COST PER STUDENT SERVED	EVIDENCE	COST/ EFFECT	RATING
Full-Day Prekindergarten Funding Source: External Grades: Pre-K	$1,596,615	1,702	$938	Rating based on average gains from Fall to Spring compared to national average.		+
SBI- All Campuses Funding Source: Local Grades: K-12	$108,398	69,440	$2			0
Title II Workshops Funding Source: External Grades: K-12	$27,242	321	$85	Rating based on participant survey		+
Title II Conferences Funding Source: External Grades: K-12	$9,964	116	$86	Rating based on participant survey		+

Rating is expressed as contributing to any of the five AISD strategic objectives.

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0	*Not significant*, needs to be improved and modified
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Blank	*Unknown*

Cost is the expense over the regular District per student expenditure of about $4,000.

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DEFINITIONS

At risk - In AISD, a student in grades 7-12 is considered at risk of dropping out if the student falls into one of 22 *risk categories*.

Cost - The total cost of the program, regardless of funding source. The cost of a program is above and beyond the cost of the regular educational program. In reporting costs, ORE standardly uses *appropriation* or *budget*, not expenditure. Some programs have capital outlay costs, e.g., for computer equipment in a lab. These costs are shown as "investment cost," i.e., the initial cost of equipment and other items to get the program going. "Operating cost" is the annual cost to keep the program functioning after large initial outlays have been made. Cost figures are rounded to the nearest dollar.

Cost/effect - "Cost per student" or "cost" (for dropout prevention programs) divided by "effect." "Cost/effect" is the *annual* cost for one month's extra achievement gain above that attributable to the regular instructional program.

Cost-effectiveness (C/E) analysis - A type of cost analysis concerned with the evaluation of alternatives according to both their costs and their effects with regard to producing some outcome or set of outcomes. In C/E analysis, a measure of cost is divided by a measure of *effectiveness*. This analysis is distinguished from other cost-effectiveness analyses by the measure used as the denominator. In cost-benefit (C/B) analysis, by comparison, the denominator is benefit expressed in dollars.

Cost per student - "Cost" divided by "number of students served." Service may have been provided to others besides students, e.g., teachers trained with Title II monies. In these instances, cost per participant should be understood. "Cost per student" is the numerator in the cost/effect calculation.

Cost Rating - A rating scale is supplied by which the relative cost of programs can be broadly gauged. The $500 figure is an arbitrary selection based on experience.

Cost is the expense over the regular District per-student expenditure of about $4,000.

0	*No cost* or minimal cost
$	Indirect costs and overhead, but no separate budget
$$	Some direct costs, but under $500 per student
$$$	Major direct cots for teachers, staff, and/or equipment in the range of $500 per student

Dropout - A student is reported as a dropout for a school year if the individual is absent for a period of 30 or more consecutive school days without approved excuse or documented transfer, or fails to reenroll by September 15 of the following school year without completion of a high school program. See "predicted dropout rate" and "obtained dropout rate."

Dropout risk probability - Based on the *risk factor* associated with the student's membership in one of 22 different *risk categories*. See "risk category" and "risk factor."

The probability that a student will drop out is based on the actual percentage of students in that risk category who have dropped out in the past. For example, if 42.66% of the students in risk category #12 dropped out the previous year, current-year students in that risk category would be assigned a dropout risk probability of 42.66.

Effect - There are two measures of "effect." One is an achievement measure based on standardized test scores, and the second is a dropout prevention measure. **All programs ultimately need to be held to the student achievement outcome criterion**, even dropout and drug prevention programs. Like cost, the effect of a program, if any, is above that of the regular instructional program.

The ROSE residual (difference between predicted and obtained score) is the measure of achievement effect, unless the participants make up a disproportionate percentage of the comparison group. If the program participants do make up a disproportionate part of the comparison group, another standard for comparison was selected.

Options other than ROSE residuals include:

- *Actual gain* expressed in grade equivalents,
- *National norm gain residual*, the difference between observed gain and an expected gain of 1.0 GE per year on the average, and
- *AISD gain residual*, the difference between observed gain and the average gain in the District.

For a program like DARE, for example, where all the 5th- and 7th-grade students are in the program, the only comparison available is the national norm.

"Disproportionate" is defined as the program students making up 25% or more of the AISD students at that grade or achievement level.

Achievement effect is expressed as a number greater than one (1). A GE gain of three months, for example, is expressed as 3.0, instead of 0.3.

The ROSE (residual) or dropout measure (predicted minus obtained rate) is used as the effect for those programs for which these measures can be obtained. For other programs, a +/-/0/blank rating is assigned on the same basis as in past years' ORE reports.

In the absence of a ROSE residual for the Composite test, the mathematics and reading residuals are averaged.

The measure of dropout effect is the "number of predicted dropouts who stayed in school," i.e., the number who did not drop out who were predicted to drop out.

Funding source - Local, external, or both. External funding may be grant or other monies from other governmental entities or private organizations.

Grades - The grade levels served by the program. Analyses are based on the grade levels for which measures are available. For example, although a program may serve grades K-6, districtwide achievement test scores are not available for kindergarten.

Level of service - Generally reported in one of three categories--(1) hours per week, (2) hours per day, or (3) full year--but may be more descriptive than quantitative.

Number of students served - May be enrollment in the program or the definition used in the evaluation last year. Not all programs serve students. In these instances, "number served" refers to participants.

Obtained dropout rate - For a program or group, the actual percentage of students who dropped out.

Predicted dropout rate - For a program or group, the sum of the *dropout risk probability* for each student in the group divided by the number of students in the group (N).

See "dropout risk probability," "risk category," and "risk factor."

For example, if the total of the students' risk factors for 90 students served by a dropout prevention program were 3,333.80, the predicted dropout rate would be 37.042, or 37.0% (3,333.80/100 = 33.338 = 33). IN other words, of 90 students served, 33 (37.0%) would be predicted to drop out based on their dropout risk probabilities.

The number of students predicted to drop out is not equivalent to the number of at-risk students because not all students who are at risk drop out, nor are all the students who drop out identified as at risk.

Predicted number of dropouts - For a program or group, the sum of the *dropout risk probability* for each student in the group divided by 100.

See "predicted dropout rate."

Program - Includes any special activity customarily thought of as a program. Some programs, e.g., Chapter 2, have multiple program components. Programs often have separate budgets.

Rating - A rating is supplied both for programs for which cost-effectiveness information can be provided and for programs about which ORE staff have an informed opinion based on evaluation information. In the former case, all programs which have a positive effect--defined as 0.1 GE (1 month's gain in grade equivalents) or better--will have a + rating. (Because the cost-effectiveness ratio grows enormous the closer to zero effect size gets, **it is impractical to report sizes smaller than 0.1 GE**). In the case of programs for which ORE does not have cost-effectiveness information but does have sufficient evaluation information for an informed opinion, the rating scale used in the program effectiveness summary pages in last year's ORE final reports is applied:

Effect is expressed as contributing to any of the five AISD strategic objectives.

+	*Positive*, needs to be maintained or expanded
0	*Not significant*, needs to be improved and modified
-	*Negative*, needs major modification or replacement
Blank	*Unknown*, may have positive or negative impact on other indicators; however, impact on the five AISD strategic objectives is unknown.

Risk category - One of 22 used to identify and track at-risk secondary (grades 7-12) students. ORE extended the four state-mandated criteria to pinpoint differential dropout rates. Greater percentages of students in some risk categories drop out than in other risk categories. Additional, optional criteria for identifying at-risk students have been specified by the State, e.g., sexual, physical, or psychological abuse, living in a residential treatment facility, and being homeless. However, AISD does not maintain centralized files on students with these characteristics. Therefore, ORE does not use these criteria to identify at-risk students.

See the 1991-92 at-risk report (ORE Publication No. 91.41) for definitions of the secondary risk categories.

Risk factor - For a given *risk category*, the percentage of students in that risk category who dropped out. Expressed as a rate, the risk factor is a two decimal-place numeral. For example, if 45.75% of the students in a particular risk category dropped out, the risk factor for a student in that category would be 45.75. In other words, a student in this risk category would have almost a 50-50 chance of dropping out.

METHOD

ORE has conducted and reported cost analyses for a number of years (see "References"). In 1992-93, ORE embarked on a new venture: cost-effectiveness analysis. Over a period of months, ORE staff engaged in considerable discussion about how cost-effectiveness should be calculated and how cost-effectiveness information should be integrated into ORE's annual report to AISD's Board of Trustees about program effectiveness. A first-person account of how staff thinking evolved and what decisions were made is detailed in "Notes on Cost Effectiveness," ORE Publication Letter 92.D. The result of that thinking is contained in *What Works, And Can We Afford It? Program Effectiveness in AISD, 1991-92*, ORE Publication Number 91.43.

The methodology developed for assessing the cost-effectiveness of programs was applied and extended in ORE evaluations of 1992-93 programs. The following is a brief exposition of ORE's method in performing cost-effectiveness analyses on AISD programs. See "Definitions" and "Notes" for additional information.

Following Levin (1983), cost-effectiveness is defined as cost divided by effect:

Cost/Effect (C/E)

Cost was defined, per earlier ORE research (see Wilkinson, 1985), as a program's *appropriation* (i.e., budget). Cost was taken to include all funding for a program, *regardless of source*. Effect was defined either as (1) *achievement*, (2) *not dropping out*, or (3) *not using drugs*.

Definitions: Cost = appropriation (budget)

Effect = **achievement**, OR

not dropping out, OR

not using drugs

The **achievement measure of effect** was operationalized as the *residual* (i.e., difference) between the achievement of the program students and some standard or expectation for their achievement. A standard against which to compare is necessary to distinguish between the effect of the special program and the effect of the students' regular instructional program. Residual was defined as the difference between predicted and obtained scores, expressed in grade equivalents (GE's), from either the Norm-referenced Assessment Program for Texas (NAPT) or the Iowa Tests of Basic Skills (ITBS), both norm-referenced, standardized achievement test batteries. Three different residuals were identified: (1) *average ROSE residual*, (2) *national norm gain residual*, and (3) *AISD gain residual*.

Definitions:

Achievement = Average ROSE residual, OR National norm gain residual, OR AISD gain residual

Residual = The difference between predicted and obtained score; for NAPT/ITBS, expressed in grade equivalents (GE's)

Average ROSE residual = The average of the residuals from ROSE, on the reading and mathematics tests or the reading test alone, across grade levels, expressed in grade equivalents (GE's)

National norm gain residual = The difference between observed gain and an expected gain of 1.0 GE per year on the average

AISD gain residual = The difference between observed gain and the average gain in the District, in GE's

ROSE, the Report on School Effectiveness, is a series of regression analyses that answer the question, "How do the achievement gains of a school's students compare with those of other AISD students of the same previous achievement levels and background characteristics?" ROSE predicts achievement scores for the group of students who have both pre- and posttest scores on the ITBS, or the NAPT, depending on grade level and year of administration. Predictions are based on:

Previous achievement level
Sex
Ethnicity
Age
Low-income status
Family income
Desegregation status of the school attended
Whether or not the student was a transfer student
Pupil-teacher ratio for school and grade

The predicted scores are then compared with the students' actual scores. The difference between the predicted and actual scores is called the ROSE residual score, which is based on a GE score scale. If students' ROSE residual scores are far enough above or below zero to achieve statistical significance, they are said to have either "exceeded predicted gain" or to be "below predicted gain." Nonsignificant residual scores are classified as "achieved predicted gain." For more information about ROSE, see Paredes (1991).

ORE's GENeric Evaluation SYStem (GENESYS) produces, among other things, a Report on Program Effectiveness (ROPE). ROSE and ROPE are very similar, the major difference between them being that ROSE evaluates schools and ROPE evaluates programs. *Most of the GE's used in calculations of achievement effect calculations were obtained from ROPE analyses produced by GENESYS. GENESYS also produces*, for each program run, counts of *the number of students predicted to drop out and the number who dropped out* (see below). For more information about GENESYS, see Ligon and Baenen (1989) and Wilkinson and Spano (1990).

The **dropout prevention measure of effect** was operationalized as the difference between the number of students in a program predicted to drop out and the actual number of students who dropped out.

Definition: *Not dropping out* = The difference between the number of students predicted to drop out, based on their at-risk category, and the actual number of dropouts

The **drug prevention measure of effect** was operationalized as the difference between the recent use of an illicit substance by program participants and by students in the District overall.

Definition: *Not using drugs* = The difference between the recent use of an illicit substance by program participants and by students in the District overall.

The measure of students prevented from using drugs was based on self-reported use of alcohol, tobacco, and other illicit substances on the Student Alcohol and Other Drug Use Survey, administered to AISD students in grades 4-12 in April 1993. The survey included items about the students' recent use of illicit substances. For students in grades 4-5, recent use is defined as use within the past school year; recent use by students in grades 6-12 is defined as use within the past 30 days. Students were also asked about their participation in Drug-Free Schools programs. The rate of recent use of any illicit substance was calculated for program participants and for the District as a whole. The number of students prevented from alcohol and other drug use reflects the difference between recent use by program participants and overall recent use by the entire sample, multiplied by the total number of students served by the program.

Cost-effectiveness was operationalized as (1) cost per student divided by achievement effect, expressed in GE's, or (2) cost of the program divided by dropout prevention effect (predicted minus actual dropouts), or (3) cost of the program divided by drug prevention effect (average rate of drug use in the District minus the rate of use for program students times the number of students served by the program).

Definitions: *Cost/Effect* = Cost per student/achievement effect, OR

Cost for the program/dropout prevention effect, OR

Cost for the program/drug prevention effect

The **cost-effectiveness ratio**, expressed in dollars, which results from this division is a measure of the cost-effectiveness of a program, i.e., the amount of effect for monies expended, and because a common effect measure was used as the denominator among like programs, programs' cost-effectiveness can be compared.

Definition: Cost/Effect = Cost-effectiveness ratio (in dollars)

Effect ratings were provided for programs (1) for which cost-effectiveness ratios could be calculated and (2) for which cost-effectiveness could not be calculated but about which other evaluation information was available. The ratings were based on the same scale which ORE had used four times previously.

Definitions: *Ratings*: Same scale as in February 1993 and February 1993 program effectiveness charts; same as in ORE's 1991-92 and 1992-93 final reports:

Effect is expressed as contributing to any of the 5 AISD strategic objectives:

+	*Positive*, needs to be maintained or expanded
0	*Not significant*, needs to be improved and modified
-	*Negative*, needs major modification or replacement
Blank	*Unknown*, may have positive or negative impact on other indicators; however, impact on the five AISD strategic objectives is unknown.

Cost is the expense over the regular District per-student expenditure of about 4,000.

0	*No cost* or minimal cost
$	*Indirect costs* and *overhead*, but no separate budget
$$	*Some direct costs*, but under $500 per student
$$$	*Major direct costs* for teachers, staff, and/or equipment in the range of $500 per student or & more

Definitions: Effect Rating =

+ = Positive achievement gain, OR
Number of students who actually dropped out was less than the number who were predicted to drop out, OR
Rate of drug use by program students was less than the rate of use by students districtwide, OR
Positive opinion, based on other indicators, such as survey results, lower retention, or other success

0 = Achievement gain less than 1 month, OR
Neutral opinion

- = Negative opinion, OR
Number of students who actually dropped out exceeded the number who were predicted to drop out, OR
Rate of drug use by program students was greater than the rate of use by students districtwide

Blank = Insufficient information

Example #1 shows the cost-effectiveness computations for a program where ROSE residuals were used as the achievement effect measure. Example #2 shows the computations for a program where the AISD gain residuals were used as the effect measure. Example #3 shows the computations for a program using a dropout prevention effect measure. Example #4 shows the computations for a program using a drug prevention effect measure.

Example #1 shows the computations for a program where ROSE residuals were used as the achievement effect measure.

PROGRAM	COST PER STUDENT FOR 1 MONTH GAIN (COST/EFFECT)	ALLOCATION (COST)	NUMBER OF STUDENTS* SERVED	COST PER STUDENT	EFFECT (in months)	RATING
Elementary Technology Demonstration School (Andrews) Funding Source: External Grades: Pre-K - 5 Level of Service: All day/all year	$119	$ 63,253 $1,580,956 Investment cost for hardware, software, and wiring.	843	$75	R: 0.5 M: 0.75 Avg.: 0.63	0

Example #1 - Elementary Technology Demonstration School (Andrews), 1992-93 - *Grades*: Pre-K - 5 - *Level of Service*: All day/all year

Cost: $63,253 (1992-93 operations), $1,580,956 (hardware, software, and wiring).

Number of Students Served: 843

Cost Per Student: $75 [$63,253/843 = $75.03 = $75 rounded]

Effect: R: 0.5M: 0.75 Avg. = 0.63

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[Because all grades were served, the ROSE residuals in reading for grades 2, 3, 4, and 5 were averaged: -0.1 + 0.2 + -0.1 + 0.2/4 = 0.05. The mathematics ROSE residuals for grades 2, 3, 4, and 5 were averaged: -0.1 +0.1 +0.2 + 0.1/4 = 0.075. Effects are transformed to months by multiplying by 10, so the reading and mathematics effects become 0.5 and 0.75 respectively. The reading and mathematics ROSE residuals were averaged:: 0.5 + 0.75 = .0.63.]

Cost/Effect: $119 [$75/0.63 = $119.05 = $119 rounded]

What this means is that it costs $119 per year per Andrews student using the computers to attain six-tenth of one month's achievement gain above that the student would normally have achieved as the result of the regular instructional program.

Rating: 0 (A rating of zero was assigned because less than a one-month achievement gain was made.)

Example #2 shows the computations for a program where the AISD gain residuals were used as the effect measure.

PROGRAM	COST PER STUDENT FOR 1 MONTH GAIN (COST/EFFECT)	ALLOCATION (COST)	NUMBER OF STUDENTS* SERVED	COST PER STUDENT	EFFECT (in months)	RATING
Secondary Program Funding Source: Local Grades: 9-11 Level of Service: Full year	$149	$815,604	608	$1,341	R: 11.0 M: 7.0 Avg.: 9.0	+

Example #2 - *Secondary Program, 1991-92 - Grades*: 9-11 - *Level of Service*: Full Year

Cost: $815,604

Number of Students Served: 608

Cost Per Student: $1,341 [$815,604/608 = $1,341.45 = $1,341 rounded]

Effect: R: 11.0 M: 7.0 Avg. = 9.0

	9	10	11	
Reading	3.9	1.3	.6	Program
Math	3.7	.7	-.5	
Reading	1.6	.9	.0	AISD
Math	1.5	.6	-.4	

[(3.9 - 1.6) + (1.3 - .9) + (.6 - 0)] = 2.3 + .4 + .6 = 3.3

3.3/3 = 1.1 average of the reading residuals

[(3.7 - 1.5) + (.7 - .6) + (-.5 - -.4)] = 2.2 + .1 + -.1 = 2.2

2.2/3 = .733 = .7 average of the mathematics residuals

(1.1 + .7)/2 = 1.8/2 = .9 average of the reading and mathematics residuals

.9 x 10 = 9.0

[District gains at each grade level were subtracted from corresponding program gains, for both reading and mathematics. The resulting residuals in reading and mathematics for grades 9-11 were then averaged. The average residuals were then themselves averaged to obtain a single, average effect. Effects are transformed to months by multiplying them by 10.]

Cost/Effect: $149 [$1,341/9.0 = $149]

What this means is that it costs $149 per year per Secondary Program student to attain one month's achievement gain above that the student would normally have achieved as the result of the regular instructional program.

Rating: +

Example #3 shows the computations for a program using a dropout prevention effect measure.

PROGRAM	ALLOCATION (COST)	NUMBER OF STUDENTS* SERVED	COST PER STUDENT	NUMBER OF DROPOUTS Predicted	Obtained	PREDICTED DROPOUTS WHO STAYED IN SCHOOL (EFFECT) #	%	COST PER STUDENT KEPT IN SCHOOL (COST/ EFFECT)	RATING
Newcomers Program Funding Source: External Grades: 9-12	$26,000	At risk: 134 Total: 134	$940	134	6	128	96	$984	+

Example #3 - Newcomers Program, 1992-93 - *Grades*: 9-12 - *Level of Service*: 3 hours/day

Cost: $26,000 What this means is that it costs $984 for each student prevented from dropping

Number of Students Served: 134 out by the Newcomers Program who would otherwise have been expected to drop out

Cost Per Student: $940 [$26,000/134 = $940.30 = $940 rounded] of school.

Effect: 128

[Predicted 134 students, Obtained 6 students]

134 - 6 = 128 students prevented from dropping out

Cost/Effect: $984 [$26,000/128 = $984.38 = $984 rounded]

Rating: +

Example #4 shows the computations for a program using a Drug-Free Schools prevention effect measure.

DRUG-FREE SCHOOLS (DFS) PROGRAM	COST	NUMBER OF STUDENTS* SERVED	COST PER STUDENT*	NUMBER OF STUDENTS PREVENTED FROM ALCOHOL AND OTHER DRUG (AOD) USE (EFFECT)	COST PER STUDENT PREVENTED FROM AOD USE (COST/EFFECT)	RATING
Drug Abuse Resistance Education (DARE)	$43,298	11,190	$3.87	1,119	$39	+

* Participants

Example #4 - Drug Abuse Resistance Education (DARE), 1992-93

Cost: $43,298

Number of Students Served: 11,190

Cost Per Student: $3.87 ($43,298/11,190 = $3.87)

Number of Students Prevented from Alcohol and Other Drug (AOD) Use (Effect): 1,119 Students prevented from AOD use by the District Drug Free School (DFS) programs is calculated by subtracting the rate of use for the DFS program students (the recent use rate for DARE participants was 30%), from the average rate of use for all students in the District (40%). That difference (10%) was multiplied by the total number of students served by the 4 program (11,190 * .10 = 1,119)

Number of Students Prevented from Alcohol and other Drug (AOD) Use (Effect): 1,119

Cost Per Student Prevented from AOD Use (Cost/Effect): $39 ($43,298/1,119 = $38.69 = $39 rounded)

Rating: +

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